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ESTIMATING HOW LONG WESTERN HEMLOCK AND WESTERN REDCEDAR TREES HAVE BEEN DEAD

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Estimates of how long trees have been dead are sometimes needed in making forest inventories or cruises and to get information on net growth. Except for an unpublished report 1/ there have been no guides for estimating the time since mortality in southeast Alaska old-growth timber. The report which follows modifies and expands the unpublished report as a guide for estimating how long western hemlock and western redcedar 2/ have been dead.

Tree decomposition observations in connection with a timber stand improvement study near Hollis, Alaska, are the bases for the guides that follow. Study trees were 141 hemlock and redcedar killed by poisoning or girdling. Poisoning was done with ammonium sulfamate crystals placed in cups chopped in the sapwood. Girdling was done with an axe or chain saw. Annual observations were made from 1950 to 1958.

Needles, branchlets, secondary branches, primary branches, bark, and bole were described according to their degree of absence. Needle fall, which marks the start of disintegration, is followed by the breakdown of the branch system. The smaller branchlets are the next to go with the larger, primary branches usually the last. The bark of both species generally remains intact for about 5 years before any noticeable sloughing is observed. Nearly half of the trees studied had at least part of the bole gone by the seventh year. Disintegration rates did not appear to be influenced by tree diameters.

1/ Anderson, H. E. Guides for estimating mortality in southeast Alaska. 1956. (Unpublished report on file at the Northern Forest Experiment Station, U. S. Forest Service, Juneau, Alaska.)

2/ Tsuga heterophylla (Raf.) Sarg. and Thuja plicata Donn, respectively.

The estimating guides in table 1 assume that trees killed by poisoning or girdling break down at about the same rate as trees killed by natural causes. In such a subjective system no one indicator should be used alone for dating mortality. An appraisal of the over-all condition of the tree is needed for best results.

Table 1.--Guides for estimating how long western hemlock and western redcedar trees have been dead, Prince of Wales Island, Alaska

Indicator	Western hemlock		Western redcedar	
	Dead 5 years or less	Dead 6 to 9 years	Dead 5 years or less	Dead 6 to 9 years
Needles	nearly gone to absent 1/	absent	half gone to absent	mostly absent
Branchlets	partly to half gone	half gone to nearly gone	partly gone to absent	half gone to absent
Secondary branches	intact to partly gone	partly to nearly gone	intact to half gone	partly gone to nearly gone
Primary branches	mostly intact	partly to half gone	intact to partly gone	partly to half gone
Bark	mostly intact	mostly intact; sometimes partly gone	intact	intact to partly gone
Bole	mostly intact	intact to partly gone	intact	intact to partly gone
Fungi		sporophore of Fomes pinicola and other fungi present		

1/ Key to indicator rating adjectives:

Term	Percent absent
intact	0
partly gone	1-24
half gone	25-75
nearly gone	76-99
absent	100

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